

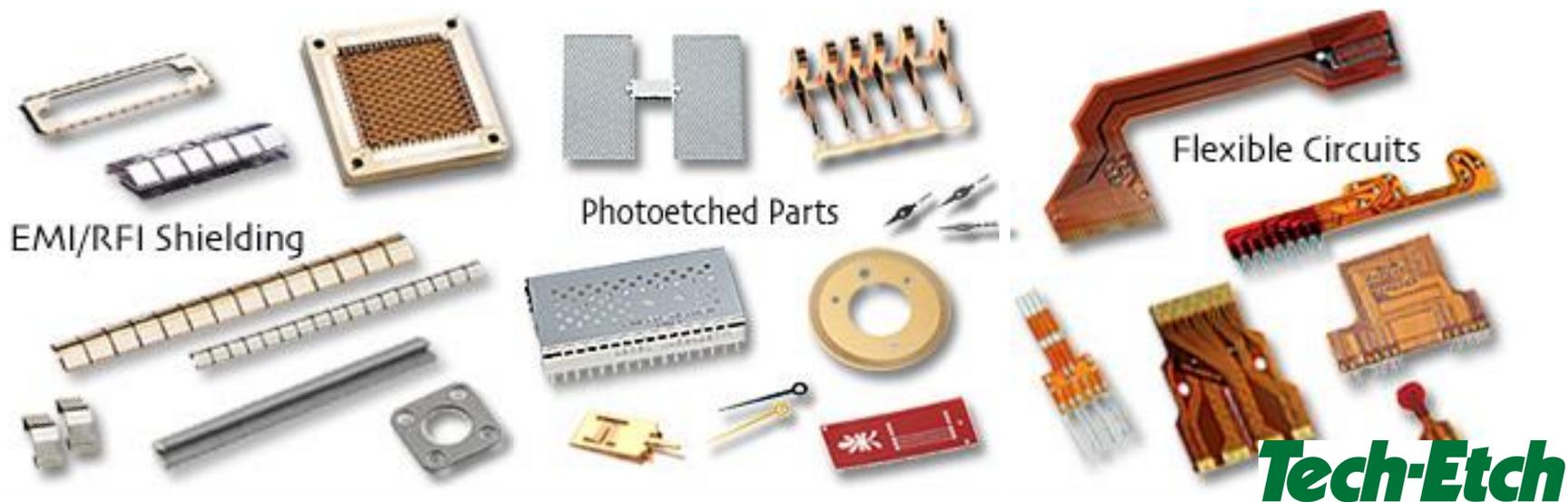
Tech-Etch

Transitioning from GEM Foils to Large Area GEM Foils

Kerry Kearney
09May2015

Tech-Etch Company Overview

- Operated under the current ownership since 1964.
- Currently employ approx. 525 people in 3 facilities.
- All manufacturing is done in the US.
- Certified to ISO 9001:2008 and AS9100:2009 Rev. C
- In house finishing and tool manufacturing
- Employee owned.
- Product offering includes RFI/EMI Shielding products, Flat and Formed Thin Metal Parts, and Flexible Printed Circuits.



Tech-Etch Company Overview



Corporate Headquarters- Plymouth, MA. Flexible Printed Circuit and Photo-Etched Parts manufacturing including plating and finishing operations for all products. Approx: 156,000 sf

Tech-Etch

Tech-Etch Company Overview



Fall River Facility- Fall River, MA.
Shielding Products manufacturing.
Approx: 46,000 sf,

Litchfield Facility- Litchfield,
MN. Photo-Etch manufacturing.
Approx: 60,000 sf



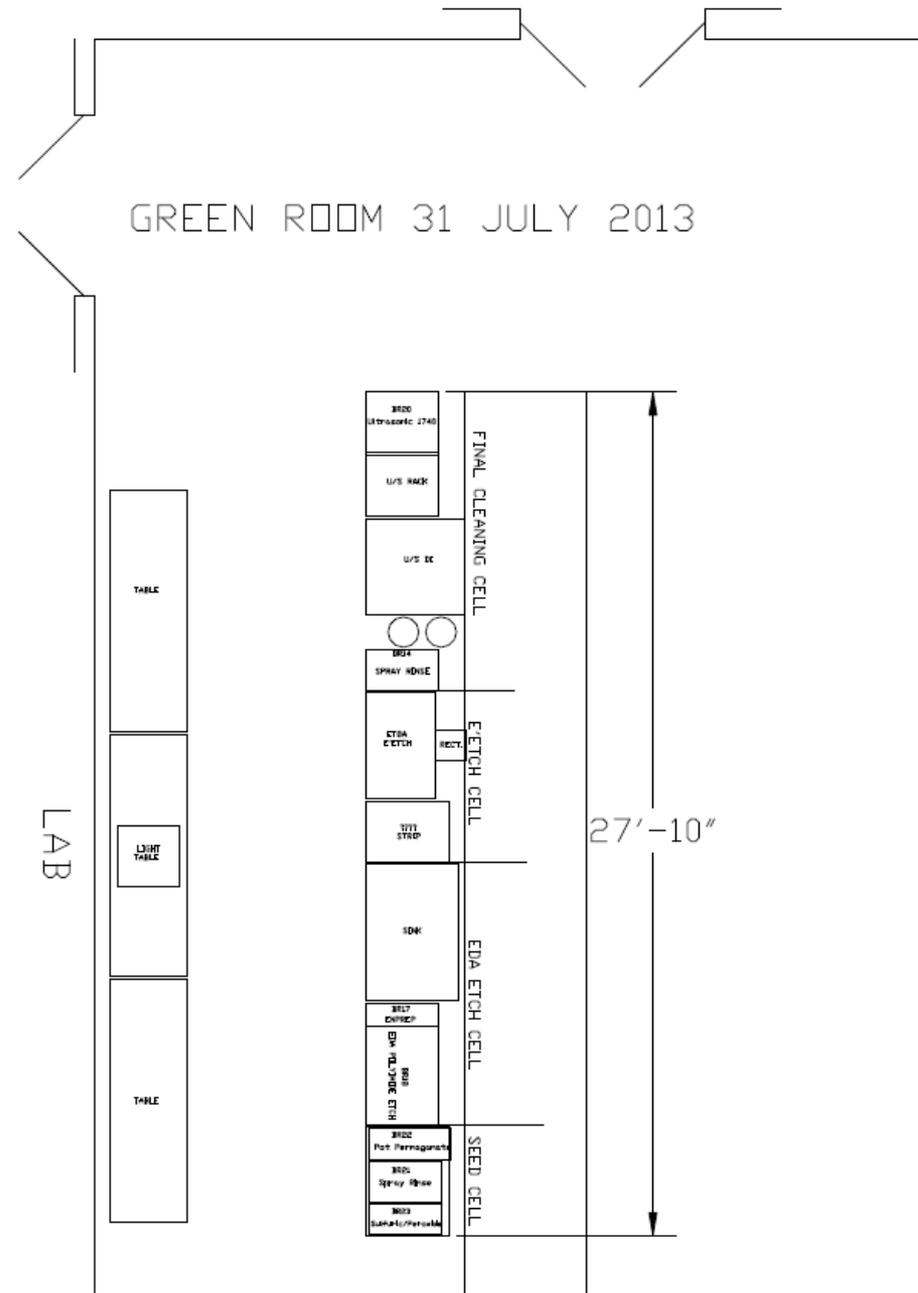
Tech-Etch

History of GEM Foil Production at Tech-Etch

- Tech-Etch has began manufacturing GEM foils for over 10 years
- Long term collaboration with BNL, MIT, Temple, Yale, University of Florida and CERN
- Completed Phase I and II of a DOE SBIR
- Licensed by CERN to produce GEM Foils
- Successfully fabricated GEM foils using both double sided mask and single sided processing

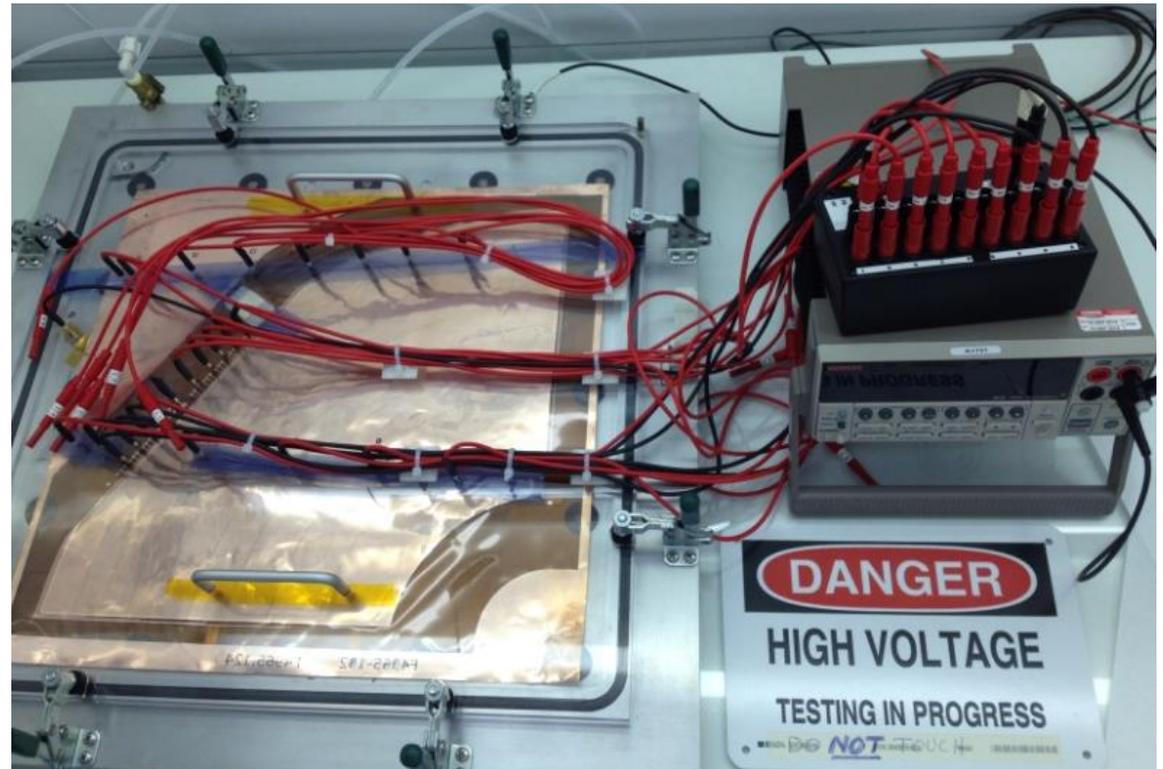
Dedicated Prototype Lab

In 2013, Tech-Etch designed and installed a 300 sf dedicated workcell to fabricate GEM foils using CERN's single mask technology.



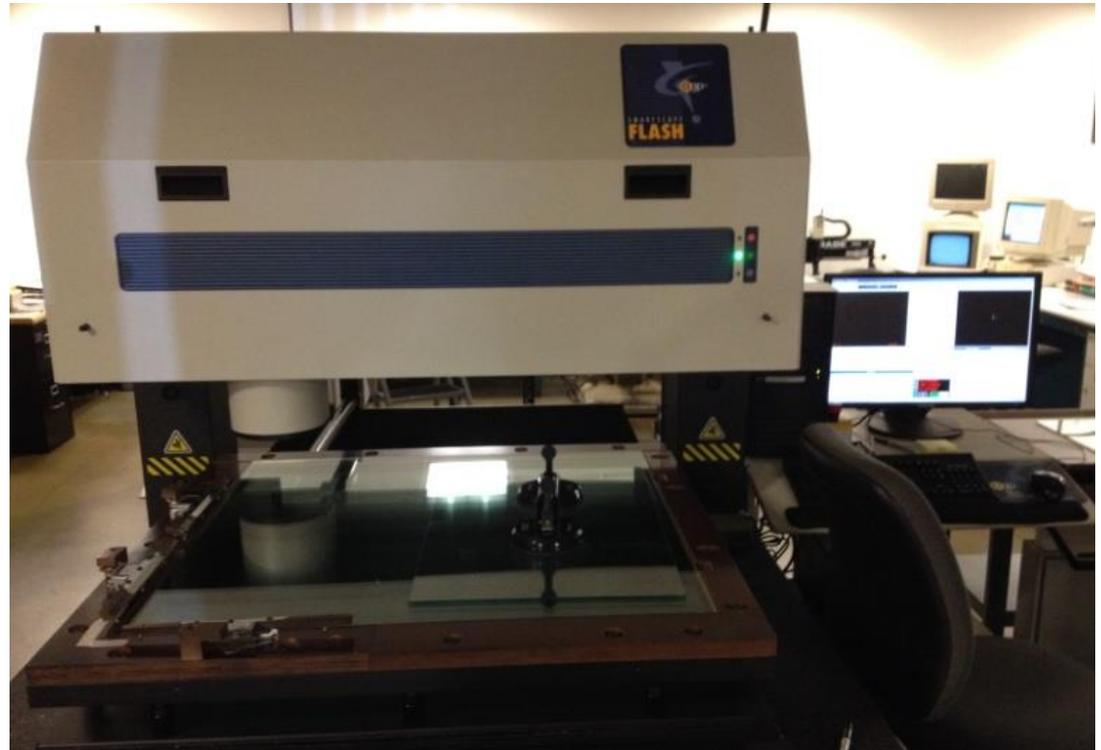
Dedicated Etest Lab

In 2013, Tech-Etch installed a dedicated workcell within an existing cleanroom to accommodate GEM foil electrical testing



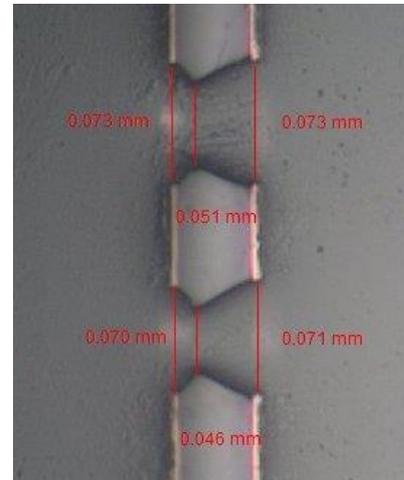
Shared manufacturing

In addition to these dedicated spaces, we leverage our flexible circuit production facility for common processes such as resist coating, exposing, developing and large format optical measurement.



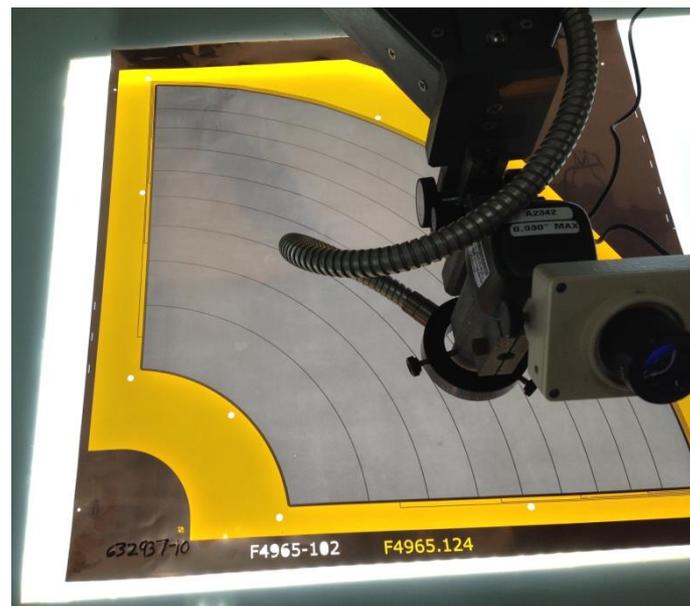
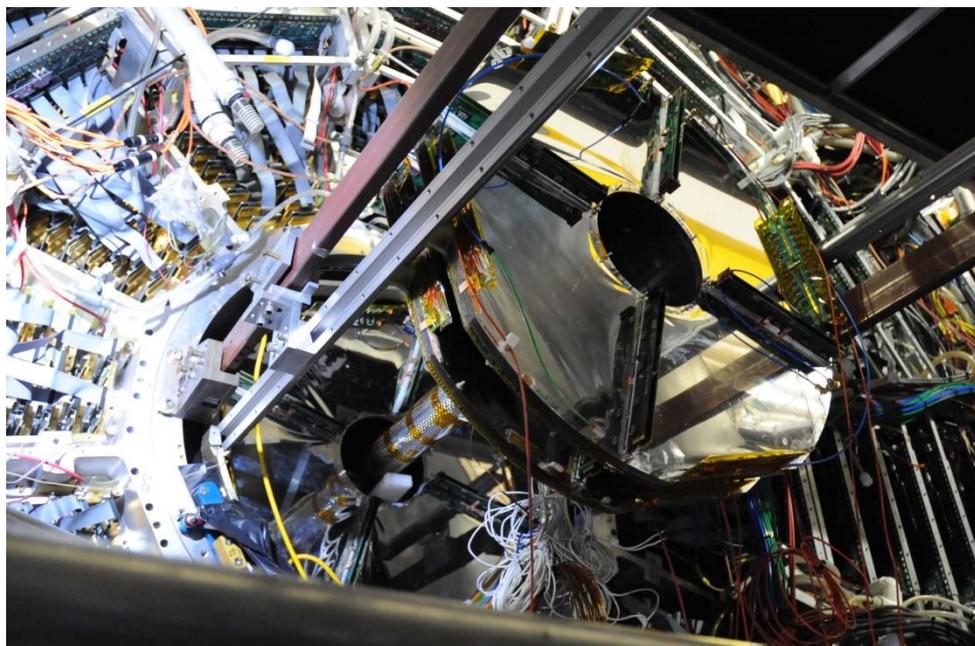
Accomplishments

Manufactured hundreds of 10x10 cm² test foils using both double and single sided mask technologies. Various shapes and configurations have been produced.



Accomplishments

Successful installation of Tech-Etch GEM foils within the Forward GEM Tracker of STAR at RHIC



Accomplishments

50x50 cm² prototypes
have been built to for
the ALICE TPC
Upgrade, IROC size
only.



Next Steps...

It's been requested that Tech-Etch expand its manufacturing capability to accommodate Large Area GEM foils that are approximately 0.5 x 1 meter².

Tech-Etch has agreed to:

- commit additional wet manufacturing floor space for processing tanks necessary to accommodate GEM foils of this size.
- upgrade shared manufacturing resources to accommodate Large Area GEM Foils.

Next Steps...

Tanks and handling equipment have been designed, but not yet ordered or built.

Approximately 600 sf of wet manufacturing floor space has been allocated for these dedicated processes.



Photo of similar equipment

Tech-Etch

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